
Water Supply Shortage Plan

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Water Supply Shortage Plan

Tualatin Valley Water District (TVWD) receives its water supplies from the City of Portland's Water Bureau (Portland) and the Joint Water Commission (JWC). The actions of our water providers, along with the condition of local water supplies, have an effect on TVWD's ability to deliver quality water supplies to its customers. The philosophy of our water providers is to "share the shortage," meaning that they will curtail all their wholesale customers by the same percent should it become necessary to decrease water use.

I. Introduction

TVWD developed this water supply shortage plan to guide the Board of Commissioners and TVWD staff in the event of a water shortage. TVWD may undertake a variety of curtailment actions, depending on the time of year and the expected duration of any water supply shortage.

Throughout any such shortage, TVWD will continue to pursue the following objectives:

- Maintain adequate volume of high-quality water supplies for all TVWD customers.
- Provide clear customer communications and rapid customer service. Be consistent with public expectations based on information shared to date.
- Promote water use efficiency.
- Control costs that come with curtailed water use, such as losses in revenue, or higher-cost water supplies (e.g., the purchase of peaking water from Portland or the lease of extra water from the JWC).
- Have an equitable impact on all users—public and private, urban and suburban, business and residential. Prioritize actions to have the least permanent negative impact.

A. System Capacity

As of 2005, TVWD supplied an average of 23 million gallons of water to our customers every day, between eight and nine billion gallons of water per year. When summer arrives and the temperature rises, water consumption rises, too. During 2004, our peak day of water usage was July 30, with 53 million gallons of water supplied.

Within the TVWD system, eight pumping stations transmit water to customers at higher elevations. The District has 24 covered reservoirs with a combined storage capacity of more than 53 million gallons. The District also maintains 726 miles of transmission pipes; these pipes distribute water from two sources.

First, the Washington County Gravity Supply Line from the City of Portland is a 60-inch main serving the District from Portland's Powell Butte Reservoir. The District owns the right to receive up to 42.3 million gallons per day (MGD) through this gravity line. Portland officials describe summer demand in three possible categories: a warm-dry scenario, a median or "most likely" scenario, and a cool-wet scenario.

Portland's Water Supply depends on Bull Run stream flow during the summer draw down period, and usable storage in Bull Run Reservoirs 1 and 2. Portland defines "usable storage" in the Bull Run Reservoirs as the amount available above the 970 feet elevation for Reservoir #1 and the amount available above 840 feet elevation for Reservoir #2. Portland's ongoing surface



water concerns include length of time to draw down the reservoirs, ability to refill the reservoirs, and turbidity events that take the reservoirs off-line.

Portland has the ability to augment these supplies with the first increment of Bull Run Lake¹ and/or groundwater from the Columbia South Shore Well Field (up to 12.4 billion gallons over a 151-day period). The Columbia South Shore Well Field is the second largest water source in the State of Oregon, with about half the capacity of Portland's Bull Run source. It is capable of producing close to 100 million gallons of water a day. During the summer of 2004, the well field provided an average of 36 million gallons a day for 29 days. The total 151-day yield of the Columbia South Shore Well Field assumes that:

- from well field start-up to 30 days of pumping, 100 percent of the initial well capacities are available;
- between 30 and 90 days of pumping, 90 percent of the initial well capacities are available;
- between 90 and 151 days of pumping, 80 percent of the initial well capacities are available.

Portland's ongoing groundwater concerns include a contamination plume and available volume. Once groundwater sources are depleted beyond their ability to meet the demand of all customers, Portland will need to activate its own curtailment plan, which applies to TVWD.

Secondly, TVWD has another 10 MGD available from the Joint Water Commission (JWC), for a total amount from the two sources that is adequate to supply the District's average and peak daily flow. TVWD is an owner with other agencies of the JWC, which uses water originating from Barney Reservoir, Hagg Lake, and the Tualatin River. As an owner of the JWC, the District owns 10 MGD from the 60 MGD treatment plant. Other JWC owners—the cities of Hillsboro, Beaverton, Tigard and Forest Grove—also use this source and have leased some of their capacity to TVWD in the past. However, these communities are also growing rapidly and plan to use more of their own water allocation in the future.

The JWC withdraws water supplies from the Tualatin River and runs the water through a treatment plant. Chlorine and pH adjustments are added to this water before it leaves the plant. The partners are expanding the treatment plant, and expect to increase the capacity from 60 MGD to 75 MGD by June 2006.

JWC members currently own the 60 MGD treatment plant, a 20 million gallon reservoir, a pumping plant, and 72" and 42" transmission mains. An additional 20 MG reservoir is currently under construction and is scheduled for completion by July 2007.

B. 10-Year Assessment of Water Shortages & Limitations

1. Drought

Drought has been the principal cause of water shortages for the region in the last 15 years.

¹ Depending on the seasonal rainfall, Portland can withdraw up to 1.8 billion gallons, until the water levels in Bull Run Lake decrease to an elevation of 3,152 feet.

1992 Drought Affecting the City of Portland

During 1992, Portland Water Bureau (PWB) and its wholesale customers, including TVWD, experienced severe water supply shortages for five reasons: (1) the Bull Run watershed, which serves the Portland metropolitan region had experienced the lowest spring rainfall and stream flows since the year 1899; (2) demand for water during May and June 1992 was unusually high due to record-breaking temperatures that occurred in the region; (3) reservoir levels were low, as they typically are in the late summer months; (4) the back-up source, the Columbia South Shore wellfield, was unavailable for sustained use because of a contamination plume, which was feared to move into the well field aquifer should those wells be used; and (5) voluntary requests to reduce water use were not effective. Shortages close to this magnitude were also reported in 1952, 1987, and 1991.

As drought conditions produced peak water needs in excess of the PWB's seasonal water supplies in 1992, the response included public announcements and monitoring of water use to urge customers to voluntarily reduce water use. In 1992, the PWB put in place mandatory water restrictions to reduce water use during the peak season and water utility staff circulated through service areas to monitor water use. TVWD, as a wholesale customer of the PWB, was subject to the curtailment measures declared by the PWB. In 1992, the PWB entered into a curtailment period supported by TVWD. TVWD prepared an ordinance in July 1992, declaring a water source emergency and imposing mandatory water conservation on its customers. The ordinance prohibited lawn watering, except in the case of newly seeded or sodded lawn and parks, washing of hard surfaces such as sidewalks and parking lots, and car washing. Following a warning, penalties for ordinance violators ranged from \$100 for the first violation to \$500 for repeat violations. A copy of the TVWD ordinance is included in Appendix B. The JWC sold water supplies to TVWD to relieve the water shortages and the urgency for water use curtailment.

In addition to implementing and enforcing curtailment measures, TVWD activated its three emergency wells and an emergency connection with the City of Hillsboro. In the aftermath, TVWD formed a conservation committee, and designed and installed a demonstration garden to promote the efficient use of water through innovative landscape design, construction and maintenance principles. It further held landscaping workshops for customers, and participated in the conservation activities of the Columbia-Willamette Water Conservation Coalition, which later merged with the Regional Water Providers Consortium (RWPC).

Since 1992, Portland has placed the South Shore wellfield into service. Had the wellfield been used in 1992, there would have been no water shortage. In addition, TVWD has purchased an ownership interest in the JWC to have access to additional and different water supplies.

2001 Drought Affecting the Joint Water Commission

The summer of 2001 was not particularly hot, but the rains filled Hagg Lake only 51 percent. As such, all municipalities using supplies from the Joint Water Commission were asked to curtail use in order to leave supplies for more senior water rights holders in the irrigation industry, as well as to leave adequate water supplies for in-stream use. Evaporation in the lake during the summer took even more water out of municipal supplies. TVWD was able to fully supply its customers using water from the Portland water system. In a similar situation in the future, TVWD would need to ask its customers to curtail water usage by 20 percent in order to fully meet their needs solely with supplies from the Portland water system. The need for 20 percent

curtailment is due to an increase in the District's population since 2001. TVWD considers JWC supplies to be 98 percent reliable.

2. Water Quality Events

Events Causing Turbidity in Bull Run Water Supplies

During severe storms, fires, and volcanic activity, there is no way to filter sediment and ash from the water and the Bull Run supplies must be temporarily shut down. In 1996, 1998, 1999, and 2004, for instance, there were storms that caused the City of Portland to temporarily shut down its Bull Run operations and rely entirely on groundwater well fields. The wells were able to fully supply customers' needs during the temporary shutdown; Portland plans to use this technique again should it become necessary. During the winter months, a complete move to groundwater supplies should have no effect on TVWD, as the wellfield can easily supply the entire region. During the summer when demand increases and supply decreases, however, the wellfield can only support the region fully for 100-150 days, assuming that all of Portland's customers cut back their volume of water use to winter levels. As previously mentioned, Portland's use of the wellfield beyond 150 days may result in the need for curtailment measures.

Endangered Species Act (ESA) Plan for the Bull Run System

During March 2005, the City of Portland unveiled a plan for the Bull Run System to improve habitat conditions for fish. The Bull Run watershed is home to several species of salmon and trout protected by the federal Endangered Species Act (ESA). About 100 years ago when the first diversion dam was built in Bull Run, the City of Portland began changing the natural flow of the Bull Run River, which flows into the Sandy River. For this and other reasons, wild populations of chinook and steelhead have declined between 75 and 90 percent in the Sandy River Basin. Operation of the Bull Run supply systems has lowered river flows, raised stream temperatures, and altered habitat. The proposed plan would do the following: (1) vary river flow during the months of July through September to support salmon spawning and rearing; (2) change operations and infrastructure to reduce water temperatures; and (3) protect and improve riparian habitat.

City officials believe that this plan will improve future water supply planning because one aspect of demand—flow releases for fish—will already be set. By some accounts, however, stream flows that are set aside to meet requirements of the Endangered Species Act comprise about one-fifth of Bull Run total supplies (*The Oregonian*, June 8, 2005). Diverting Bull Run water from municipal drinking water supplies will force the City of Portland to rely on groundwater supplies more frequently than it currently does.

Contamination of Source Water Supplies

The City of Portland's supplies come from the Bull Run Watershed and are mixed with water from the Columbia South Shore Well Field during periods of high water use or high turbidity (amount of sediment in the water) in the Bull Run Watershed. The source of Bull Run water originates in the Mount Hood National Forest in the Cascade Mountains and remains upstream from any industrial, residential, or man-made discharges. Approximately 53 percent of the watershed is classified as "old growth." Black bear, deer, elk, cougar, and bobcat all live in the watershed along with numerous other species, including the northern spotted owl. Possible

contamination in Bull Run comes from animal matter and other natural events in the watershed, such as floods and wildfire.

The only treatment process that Portland has in place at this time is disinfection (with chlorine & ammonia) and adjustment for pH to make the water less corrosive to pipes. Although it destroys *Giardia*, chlorine is not considered effective on *Cryptosporidium*—a waterborne organism that can cause illness or even death in immuno-compromised individuals. Although these organisms do exist in very small amounts in the Bull Run Watershed, they are found in more significant numbers in raw sewage. The Bull Run drinking water system has historically had no sewage exposure, as Federal law protects the watershed and trespassing is illegal. The water used by TVWD is contained in pipes and not exposed from the time it leaves Bull Run to the time it exits the customer's tap.

The JWC has two raw water impoundments in separate locations that are well upstream of urban and agricultural runoff. Therefore, the risk of water supply contamination is relatively low. In the event of source contamination, the plant filtration and disinfection processes meet all current regulatory requirements for inactivation and removal of *Giardia*, turbidity, and other primary and secondary regulated contaminants. In addition, the recent treatment plant expansion anticipated upcoming regulations for *Cryptosporidium*. Currently, there is 20 MG of finished water storage in the JWC system. During a disruption of the plant, the finished water storage provides a period of time to allow operational response to treatment of the contaminated supply. During any disruption of treatment, the more finished water storage available in the JWC service area, the longer the response period can be without adversely affecting customers.

3. System Interruptions

Interruption of Commercial Power Supply to a Critical Part of the City Water System

A power outage could be caused by a number of factors, such as power failure experienced by the local electric utility (Portland General Electric), local damage to transformer facilities, earthquake damage, or flood damage. The JWC plant has experienced power service outages lasting as long as 24 hours. It has back-up power generation for various plant components, but no back-up power supply for the raw or finished water pump stations. In the event of a power outage, system delivery capacity would be limited to stored finished water supplies in the Fern Hill Reservoirs. The maximum supply available during a power outage would be limited to the supply stored in the tanks at the time of the outage. The 20 MG storage capacity corresponds to less than an average day's worth of supply.

Major Water Transmission Line Break

The TVWD distribution system receives water supplies from both the Joint Water Commission to the west and the City of Portland to the east. The system has closed connections at 23 locations, which provide a means to route supplies in either direction in the event of an emergency.

Reservoir Failure

The Portland metropolitan region is in a seismic Zone III area. Recent studies indicate the Portland metropolitan region may be at risk for a large subduction zone earthquake sometime

within the next 200 years. The estimated magnitude of a subduction zone earthquake is approximately 8.7 to 9.2 on the Richter scale. The JWC plant was constructed in an area of soft, silty soils that have liquefaction potential. Its latest upgrade was designed to meet current seismic codes, with components such as the stone columns constructed beneath the flocculation/sedimentation basins to reduce the risk of liquefaction failure. The older plant components would be at greater risk of damage since they were built prior to the Zone III rating. However, the design of the latest plant expansion and upgrades provides a reliable path of treatment following a major earthquake. The Barney Reservoir and Hagg Lake expansions were designed to meet Maximum Credible Earthquake Standards.

4. Contractual Considerations

Peak Demand Outstripping Contractual Supply

Population growth projections over the next 50 years are showing that total peak customer demands would increase rapidly, from 50 MGD during 2004 to 78 MGD during 2050 even with conservation. TVWD experienced a peak demand of 53 MGD in July 2004. TVWD was able to lease additional capacity from another member of the Joint Water Commission (JWC) to make up the shortfall. During 2005 TVWD signed a five-year leasing agreement with other members of the JWC for additional supplies. TVWD is also using its conservation programs as one way to “stretch” our supplies, while we develop additional water sources for an expected future population boom.

Water Rights Withdrawal Limitations

Currently, the City of Portland makes 42.3 MGD available to TVWD through its gravity delivery system. As an owner of the JWC, the District owns 10 MGD from the 60 MGD treatment plant.

Expired Water Purchase Contracts

TVWD owns the right to receive up to 42.3 MGD from the City of Portland through the Washington County Supply Line. When TVWD's contract expires in 2007, TVWD will need to replace those 42.3 mgd, either through a new contract with the City of Portland or through a new water source. As a result, TVWD has begun to explore alternative water source options.

The contract with JWC does not expire.

C. Planning for Future Events

TVWD has no bottlenecks, such as undersized pumps or small storage capacities, compared to maximum day demand.

TVWD would plan to use these same techniques again in the future—multiple sources, emergency wells, interconnections, and curtailment—should another shortage arise.

1. Wells

The District has three back-up wells, capable of supplying 3.39 MGD for more than one week during emergencies. One of the wells would require blow-off for one day before using, and all three have taste issues, although the water quality is within state and federal drinking water standards. There are 11 million gallons of water stored in an Aquifer Storage and Recovery

(ASR) system at one of the sites, and an additional 300 million gallon ASR system in the permitting stages.

2. Interconnections

TVWD has agreements with neighboring jurisdictions to provide mutual aid and water supplies during emergencies.

TVWD has emergency interconnections with Hillsboro, Beaverton, West Slope Water District, the City of Tigard, and Raleigh Water District.

TVWD has six emergency interties with Hillsboro: three 12-inch connections, one 10-inch connection, and two 8-inch connections, all located on the west side of the distribution system. Several smaller non-metered interconnections between the two systems also exist. A jointly-owned 42-inch transmission line provides a direct connection between Hillsboro and TVWD supplies.

This transmission line also connects TVWD and the City of Beaverton. Through past operating agreements, TVWD has supplied Beaverton during emergency conditions by “wheeling” water through its system, allowing Beaverton to purchase as much as 4 MGD of additional JWC supply through the southside transmission line. This arrangement has hinged on an administrative policy with PWB to allow TVWD to take an additional 4 MGD of Portland supplies during emergency and peak conditions.

The West Slope Water District connection is a 10-inch turbine meter connection capable of delivering 5,500 gallons per minute (gpm). The Tigard connection is an 8-inch turbine meter connection capable of delivering 1,400 gpm, and the Raleigh Water District connection is a 6-inch connection capable of delivering 1,800 gpm.

The Metzger area of the District can only receive water coming from the City of Portland; it has no connections to the Joint Water Commission.

II. Phased Curtailment Plan

TVWD's General Manager will decide when each of these four stages should be enacted:

Stage 1: Routine Summer Advisory

TVWD predicts that we will face these conditions each summer, as warm dry weather settles into the region and drawdown of the reservoirs begin. Summer water use typically doubles or triples winter use, as customers begin to irrigate their landscapes, wash cars, and use water for cooling purposes.

Water Reduction Goals & Objectives

Each user should strive to maintain, not exceed, average summer usage levels.

Triggers (any of these)

- Portland Water Bureau issues a “notice of drawdown,” announcing the release of stored water in the Bull Run System.
- Portland Water Bureau activates groundwater wells as part of its supplies.
- Hagg Lake fails to fill 100 percent before summer (May 1). It holds 53,000 acre-feet (17.3 billion gallons).
- Barney Reservoir fails to fill 100 percent before summer (May 1). It holds 20,000 acre-feet (6.5 billion gallons).
- The Joint Water Commission issues a “notice of drawdown,” announcing the release of stored water.

Public Message: Voluntary Conservation Measures

- Each summer, TVWD asks its customers to use a voluntary outdoor watering schedule, based on the weather. Lawns only require one inch of rain per week; during rainy weeks customers do not need to water as much.
- Promote already-existing conservation messages, such as “Use Water Wisely!” See TVWD.org for a list of water saving ideas.

Possible TVWD Actions

- Stop TVWD hydrant flushing program until fall rains resume.
- Partner with Regional Water Providers Consortium and west side providers to send consistent conservation messages to the media.
- Place conservation reminders and tips in *Water Words*, bill message, and on TVWD's website and conservation hotline. Use various venues to distribute information. Set up public information booths where opportunities exist and look for other opportunities for public outreach, such as speaking engagements, etc.



Partners to Contact

- Work with local agencies to coordinate resources and uniform messages for water customers, and to prepare, review and/or update local water ordinances regarding curtailment enforcement.

Stage 2: Moderate Water Supply Shortage

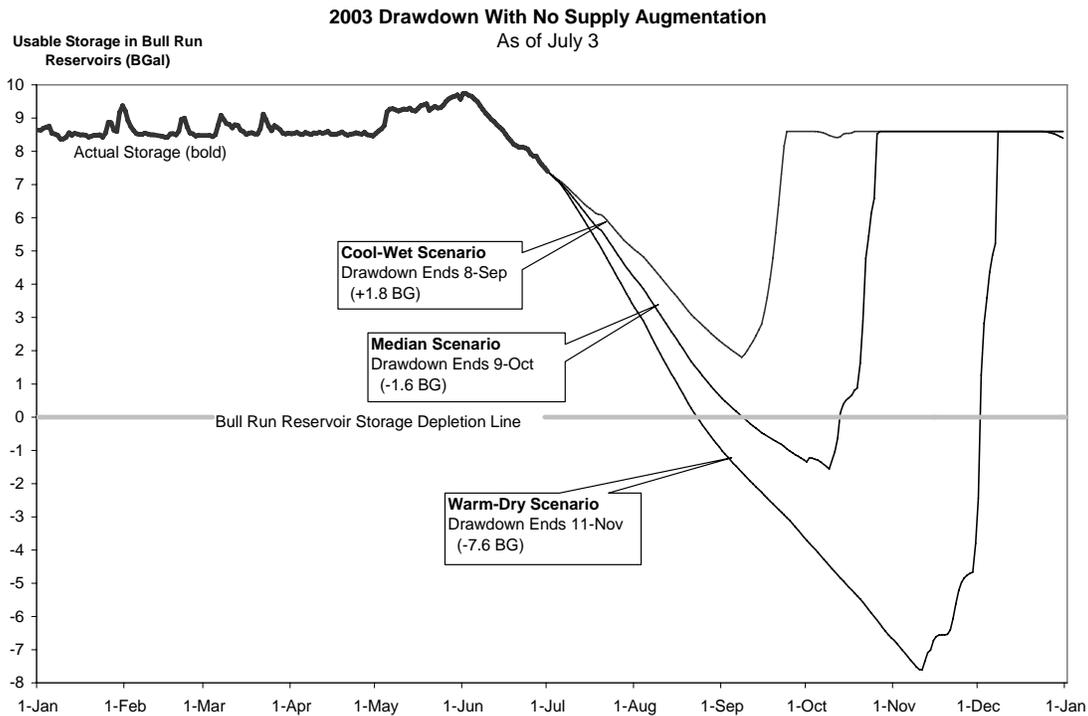
This may be a temporary condition of several days, caused by service interruptions in the region. During this time, TVWD may redirect supplies to areas experiencing shortages. Or, this may be an intermediate stage of an ongoing water supply shortage. Regional reservoirs may have begun “summer drawdown,” with no rain in the forecast. Customers should voluntarily limit their use of water.

Water Reduction Goals & Objectives

Stretch existing supplies to last throughout the shortage. Decrease overall daily water use by 10 percent.

Triggers (any of these)

- Portland Water Bureau is operating under a warm-dry scenario [see the example diagram below, updated by city officials each year].



- Hagg Lake fails to fill 80 percent before summer begins on May 1 to 42,400 acre-feet (or 13.8 billion gallons). The Joint Water Commission will only make the full allotment available to municipal users if the lake fills at least 80 percent.
- TVWD customer use reaches contractual and/or facility capacity for seven consecutive days.

Public Message: Voluntary Conservation Measures

- Reduce all water use by 10 percent (as a rule of thumb, for example, residential customers in a four-person single-family household should try to reduce their use by about 20 gallons per household per day during the winter and 27 gallons per household per day during the summer).
- Limit use of water in commercial businesses (e.g., do not serve water to restaurant customers unless specifically requested).
- Eliminate wasted running water, such as unattended hoses, obvious leaks, etc.
- Reduce watering of lawns, plants, trees, gardens, shrubbery, and flora on private or public property to the minimum necessary. Conduct outdoor watering during early morning hours to reduce evaporation (preferably between 4:00 and 8:00 a.m.; must conclude by 10:00 a.m.).
- Eliminate all other kinds of outdoor water use, including:
 - a. Washing down of hard surface areas, decks, buildings, gutters, and vehicles;
 - b. Use of freshwater in fountains, reflection ponds, and decorative water bodies for aesthetic or scenic purposes, except where necessary to support aquatic life;
 - c. Filling or maintaining private swimming pools (you may use children's wading pools);
 - d. Use of fire hydrants for any purpose other than firefighting or flushing essential to maintain water quality.

Possible TVWD Actions

- Issue a notice to the local media that the District is in a Moderate Water Supply Shortage.
- Send postcard notification of Moderate Water Supply Shortage to TVWD customers.
- Turn off automatic irrigation and water features in TVWD's demonstration garden.
- Provide reminders to non-efficient users (including customers who have been given a 30-day notice to repair one or more leaks and have failed to do so).
- Continue to encourage and educate customers to comply with voluntary water conservation.
- Routinely publish in the *Beaverton Valley Times*, *Hillsboro Argus*, *Tigard Times*, and *The Oregonian* the voluntary conservation measures that the customers are requested to follow during a Moderate Water Shortage.
- Place reminder messages on in *Water Words*, in the bill message and on the District Web site, as well as on billboards, signs, bus-sides, and movie theatre ads.

Partners to Contact

- Contact potential institutional partners in water conservation, including local businesses that are the most affected (e.g. landscapers/green industry, commercial carwashes, nurseries, restaurants, water-intensive manufacturers, etc.).
- Ask cities/counties to postpone enforcement of landscape ordinances.
- Make conservation presentations to Homeowner Associations (HOAs) and Community Planning Organizations (CPOs).

Stage 3: Severe Water Supply Shortage

This is a stage of “restricted” watering; customers still have time to prepare and conserve before a loss of service. Scenarios include protracted period of drought (similar to the drought of 1992) or multi-day disruption of service across sections of TVWD’s service territory. Such scenarios may not affect both of TVWD’s water sources equally.

Water Reduction Goals & Objectives

Be able to re-direct unaffected supplies without removing any customers from the system.
Decrease overall daily water use by 25 percent.

Triggers (any of these)

- Portland moves to groundwater sources entirely.
- The Portland system cannot meet supply demands of wholesale customers.
- JWC reservoirs drop below 40 percent of “normal conditions”; under such circumstances JWC enacts mandatory curtailment for its members.
- Water supplies fail to meet U.S. Environmental Protection Agency Safe Drinking Water Act standards.
- TVWD’s distribution system experiences a significant and sustained reduction of water pressure.
- TVWD customer use reaches contractual and/or facility capacity for 14 consecutive days.

Public Message: Mandatory Curtailment Measures

- Water is in short supply.
- Reduce all water use by 25 percent (as a rule of thumb, for example, residential customers in a four-person single-family household should try to reduce their use by about 50 gallons per household per day during the winter and 70 gallons per household per day during the summer).
- TVWD will enforce its *Water Supply Shortage Plan*.
- Mandatory Actions include:
 - a. Eliminating all outdoor water use, including:
 - i. Irrigation of established lawns (those at least six weeks old). Exceptions include: commercial sod farms, high-use athletic fields that are used for organized play, and daycare providers. Residents may hand-irrigate ornamental plants, flowers, and vegetable gardens during early morning hours to reduce evaporation (preferably between 4:00 a.m. and 8:00 a.m.; must conclude by 10:00 a.m.);
 - ii. Irrigation of golf courses. District water cannot be used to irrigate fairways or greens on golf courses. Hand watering of ornamental plants and flowers is permitted during early morning hours to reduce evaporation (preferably between 4:00 a.m. and 8:00 a.m.; must conclude by 10:00 a.m.);

- iii. Washing down of hard surface areas, decks, buildings, gutters, or vehicles. Wash-down is allowed for sanitary purposes only;
- iv. Use of freshwater in ornamental fountains, reflection ponds, and decorative water bodies for aesthetic or scenic purposes, except where necessary to support aquatic life;
- v. Filling or maintaining private swimming pools (you may use children's wading pools); and
- vi. Use of fire hydrants for any purpose other than firefighting or flushing essential to maintain water quality.
- b. Prohibit chemical applications to lawns that require subsequent watering.
- c. Limit expanding commercial nursery facilities, placing new irrigated agricultural land in production, or planting or landscaping when required by site design review process.
- d. Limit use of water in commercial businesses (e.g., do not serve water to restaurant customers unless specifically requested).
- e. Repair leaks in hoses, faucets, and couplings.

Possible TVWD Actions

- Issue a statement that the District is experiencing a Severe Water Supply Shortage; notify the local media and send postcard notification to TVWD customers.
- Turn off automatic irrigation and water features in TVWD's demonstration garden.
- Cease water service to customers who have been given a 30-day notice to repair one or more leaks and have failed to do so.
- Implement the enforcement provisions of TVWD's *Water Supply Shortage Plan*.
- Routinely publish in the *Beaverton Valley Times*, *Hillsboro Argus*, *Tigard Times*, and *The Oregonian* the mandatory restrictions to be placed on the use of water supplied by the District.
- Through the media and public outreach efforts, including door hangers, publicize widely the penalties to be imposed for violations of mandatory restrictions and the procedures to be followed if a variance in the restrictions is requested.
- Place reminder messages on in *Water Words*, in the bill message and on the District Web site, as well as on billboards, bus-sides, TV, radio, and movie theatre ads.
- Provide and advertise conservation hotline.
- Update and mail "What If Summer Doesn't End on Labor Day?" conservation brochure to customers.
- TVWD will not reimburse customers for bottled water or hotel stays resulting from any Water Supply Shortage.

Partners to Contact

- Remind business, industrial, and government (B.I.G.) customers of any letters of cooperation that TVWD may have signed with them to prepare for Stage 4 curtailment situations.
- Send pre-drafted letter of intent to local jurisdictions (Portland, Tigard, Hillsboro, and Beaverton) to let them know the District plans to begin issuing fines to any of their residents who are not complying with the District's mandatory restrictions.
- Inform landscape / green industry of prohibitions on irrigation and chemical applications that require irrigation.

- Work with Tualatin Valley Parks and Recreation to suspend irrigation of parks where applicable.
- Work with jurisdictions and HOAs to temporarily suspend regulations that require the use of water (Landscape Ordinances, etc.).

Stage 4: Critical Water Supply Shortage

This may include emergency conditions under which little or no water is flowing to customers (as in the case of natural disasters that result in sudden and acute water loss). It may be necessary for the District to proceed directly to Stage 4. Or, this scenario may indicate an extended period of time in which demand outstrips supply.

Water Reduction Goals & Objectives

Protect safety, health, and economic livelihood. Decrease overall daily water use by 50 percent or more.

Triggers (any of these)

- Portland offloads TVWD from its system and JWC cannot meet TVWD's resulting demands for water.
- JWC offloads TVWD from its system, and Portland supplies cannot make up the difference.
- Supplies are either physically cut off or become unavailable.
- TVWD customer use reaches contractual and/or facility capacity for 28 consecutive days.

Public Message: Mandatory Curtailment Measures

- Water will be used for drinking, cooking, and sanitation purposes only.
- Reduce all water use by 50 percent (as a rule of thumb, for example, residential customers in a four-person single-family household should try to reduce their use by about 100 gallons per household per day during the winter and 140 gallons per household per day during the summer).
- Eliminate use of water at construction sites.
- Enforcement of TVWD's *Water Supply Shortage Plan* includes fines.

Possible TVWD Actions

- Issue a statement that the District is experiencing a Critical Water Supply Shortage.
- Issue media releases.
- Continue to enforce *Water Supply Shortage Plan* with warnings, fines, and discontinued service if necessary.
- Place reminder messages on in *Water Words*, in the bill message and on the District Web site, as well as on billboards, bus-sides, TV, radio, and movie theatre ads.
- Provide and advertise conservation hotline.
- If necessary, conduct the following emergency actions:
 - a. Activate TVWD's Emergency Operations Center (EOC).
 - b. Begin rationing water as needed.
 - c. Activate any curtailment agreements previously negotiated with B.I.G. customers.
 - d. Open interconnections with neighboring water suppliers.

- e. Bring emergency wells on-line.
 - f. Declare emergency (per TVWD Purchasing Policy) to allow suspension of the normal bidding process.
 - g. Place a moratorium on all new water service connections and new water main extensions. Provide notice to developers of the moratorium.
- TVWD will not reimburse customers for bottled water or hotel stays resulting from any Water Supply Shortage.

Partners to Contact

- Ask Tualatin Valley Fire & Rescue Fire Marshall to issue statement banning burning or construction (because these activities are possible fire hazards).
- Activate any previously agreed upon curtailment arrangements with B.I.G. customers.
- Inform developers of the moratorium on all new water service connections and water main extensions.
- Notify and work with neighboring water providers.
- Activate partnerships with bottled water manufacturers, National Guard, Red Cross or other water distributors if needed.
- Contact the Washington County Office of Consolidated Emergency Management for additional resources.



III. Related Documents

- A. American Water Works Association. *Water Resources Planning Manual*. Page 90.
- B. Joint Water Commission. Resolution 3230. July 13, 1993. This resolution created an interim water conservation plan for the Joint Water Commission. See Appendix A for full text.
- C. Joint Water Commission. "Water Management Plan of 1998/Water Management Plan Update of 2003." Final Report. Montgomery Watson Harza.
- D. Oregon Revised Statute 536-700 allows the state to declare an emergency and require water suppliers within a drought area to adopt and implement a water conservation or curtailment plan.
- E. Oregon Administrative Rule 690-019-0070 "Drought Mitigation Rules"
- F. City of Portland's Water Bureau /Wholesalers. *Intergovernmental Water Purchase Agency Agreement*. Signed Sept. 20, 1979; expires during 2007.

In times of water shortage, water use will be curtailed to the extent permitted by law in the following order. The curtailment contemplated by Items 1 through 3 will be applied uniformly to all users.

1. Restriction of uses that can be accomplished without serious injury to person or property and prohibition of non-essential uses.
2. Prohibition of irrigation except for commercial greenhouses.
3. Prohibition of every use except for domestic use and for essential commercial enterprises and industry.
4. Prohibition of all use outside the City except domestic uses.
5. Prohibition of all use inside the City except domestic uses.

Each year, the City of Portland provides additional planning details to its wholesale customers, by publishing a "Seasonal Water Supply Augmentation and Contingency Plan." The most recent version was produced May 12, 2004. In it, Portland officials outline three summer supply scenarios. A Cool-Wet scenario line depicts how much water would be needed if the summer were unusually wet and cool. The Warm-Dry scenario describes how much water would be needed if the summer is unusually dry and hot. As the scenarios become more hot and dry, customers not only require more water for drinking, bathing, and outdoor water needs, but the City itself has increased requirements to release water into Bull Run River in order to lower temperatures and increase flows for fish habitat.

The May 2004 correspondence also outlines various water supply curtailment options. For example, in Tier 1, the City of Portland would decrease supplies to Clackamas River Water, it would drop water supplies in Bull Run Lake to an elevation of 3,152 feet, and it would request voluntary curtailment measures. In Tier 2, it would decrease supplies to Milwaukie, Oregon, it would drop level of both Bull Run Lake and Bull Run Reservoirs, it would implement mandatory curtailment measures, and it would offload TVWD's wells.

- G. Oregon Water Utilities Council, SDAO, LOC, and Oregon WRD. *Water Management and Conservation Plans: A Guidebook for Oregon Municipal Water Suppliers*. May 2003.

- H. Tualatin Valley Water District. Ordinances No. 1-92 and 2-92, *Amending the District's Rules and Regulations Regarding Water Conservation and Declaring an Emergency*. 1992.

Ordinance 2-92 is paraphrased below. See Appendix B for the full text.

...In the event the Board of Commissioners shall by minute order, resolution, or ordinance determine that conditions exist by which require the restriction and/or prohibition of use of water in order to protect the health, peace, safety, and welfare of the customers of this District, the Board shall establish a schedule of use restrictions and prohibitions...Upon such action by the Board, water shall not be used within the boundaries of the District except for domestic uses of drinking, bathing, and other household uses.

- It shall be expressly prohibited to water, sprinkle, or irrigate lawns, grass, or turf unless it is new lawn, [has received a one-time application of] pesticides and fungicides, part of a commercial sod farm, high use athletic fields that are used for organized play, golf tees and greens, park and recreation areas deemed by the Board to be of particular significance and value to the community, and daycare providers.
- Watering, sprinkling, or irrigating of flowers, plants, shrubbery, groundcover, or trees may only occur between Sunday at 6 pm to Monday at 10 am, and between Wednesday 6 pm to Thursday at 10 am.
- Customers may not wash, wet down or sweep with water any sidewalks, walkways, driveways, parking lots, open ground or other hard surfaced area unless there is a demonstrable need in order to meet public health and safety requirements, or in preparation for painting, repair, remodeling or reconstruction.
- Customers may not wash land- or water-borne vehicles, except in circumstances listed above.
- Customers should wash windows with a bucket and squeegee.
- Repair leaks in hoses, faucets, and couplings.
- Filling any container, vessel, or tank within the District's water distribution system for the purposes of irrigating lawn, grass or turf for a fee or other compensation is prohibited.

These restrictions shall be enforced with the delivery of a notice of violation, followed by fines in \$100, \$300, and \$500 increments. Nothing herein shall prevent the District from seeking an injunction to prohibit violation of the District's Rules and Regulations, which may include disconnection of water service.

- I. Tualatin Valley Water District. Ordinance 1-99. *An Ordinance Amending Rules and Regulations*. Excerpts of Ordinance 1-99 are below.

"Use of Water." ...In the event that the Board of Commissioners shall determine that conditions exist which require the restriction or prohibition of use of water in order to protect the health, safety and welfare of the customers of the District, the Board shall establish a schedule of use restrictions and prohibitions. The schedule shall indicate the uses prohibited or restricted and the period or periods of prohibited and/or restricted use. Any customer using water in violation of said adopted schedule shall be given notice in writing by the District of said violation, which notice shall advise the customer that if said unlawful use is not discontinued upon delivery of said notice, the water service to said premises shall be

terminated. The notice of violation and termination shall be delivered to the user of the premises at which the unlawful use is occurring. If the District is unable for any reason to serve said notice on the user personally, the then said notice shall be posted on the premises and said posting shall constitute delivery of notice.

“Private Pool and Tank.” When water is to be used for filling a swimming pool, tank, or other uses, which require abnormally large quantities of water, authorization must be obtained from the District prior to the taking of such water.